BANGALORE WATER SUPPLY AND SEWRAGE BOARD
CAUVERY BHAVAN, KEMPEGOWDA ROAD
BANGALORE - 560 009

Telephone: 91-80-22945106 Fax: 91-80-22945106

Through E-Procurement

TENDER FOR THE WORK OF

DESIGN CONSTRUCTION, AND COMMISSIONING OF **50 MLD STP BASED ON SBR WITH BNR, TERTIARY TREATMENT AND POWER GENERATION WITH ADDITIONAL SECONDARY SLUDGE FROM EXISTING 50 MLD STP & ODOUR CONTROL UNITS AT KADABEESANAHALLI** INCLUDING 7 YEARS OF OPERATION & MAINTENANCE (TURNKEY CONTRACT)

VOLUME 3 of 4

(DRAWINGS)

OCTOBER – 2025

Office of the *Chief Engineer (WWM-E)/CE (UWP)*
BANGALORE WATER SUPPLY & SEWERAGE BOARD
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CONTENTS			
Volumes	**Part**	**Sections**	**Description**
Volume-1	**Bidding Procedures**	**Section-1**	Invitation for Tenders (IFT)
		Section-2	Instructions to Tenderers (ITT)
		Section-3	Qualification Information and Evaluation Methodology
		Section-4	Form of Tender, Letter of Acceptance, Notice to Proceed with the work and Agreement Form
		Section-5	Conditions of Contract (CC) and Special Conditions of Contract (SCC)
		Section-6	Contract Data and Appendix to Special Conditions of Contract
		Section-7	Specifications
		Section-8	Drawings
		Section-9	Price Schedule
		Section-10	Format of Bank Guarantee for Security Deposit
Volume-2	**Technical Specifications and Technical Schedules**	**Section - 7**	**Specifications**
			Part-1: Project Details
			Part-2: The Site
			Part-3: General Requirements
			Part-4: General Workmanship, Materials and Design Requirements for Plant
			Part-5: Process Requirements
			Part-6: General Electrical Requirements
			Part-7: Instrumentation Control and Automation Works
			Part-8: General Mechanical Requirements
			Part-9: General Painting and Protection Requirement
			Part-10A: Technical Specifications for Civil, Structural Works
			Part-10B: Particular Technical Specifications for Civil and Structural Works
			Part -11: Particular Mechanical Requirements for TSPS, STP
			Part-12: Particular Electrical Plant Requirements
			Part-13: Particular Instrumentation & Control Requirements

CONTENTS			
Volumes	**Part**	**Sections**	**Description**
			Part-13B: Particular Operation and Control Philosophy
			Part 14: Inspection, Testing and Commissioning Requirements
			Part 15: Training & Advisory Requirements
			Part 16: Operation & Maintenance
			Part 17: Handing Over
			Part 18: Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP)
		Section- 7A	**Form of Technical proposal**
		Section- 7B	**Technical Schedules**
			Technical Schedule - I: Construction Programme
			Technical Schedule-II: Proposed Plant Details
			Technical Schedule-III: Instrumentation Control & Automation Equipment's
			Technical Schedule-IV: Electrical works
			Technical Schedule V: Operating Details
			Technical Schedule VI: Schedule of Subcontractors
			Technical Schedule VII: Quality Assurance and Quality Control Plan
			Technical Schedule VIII: Environmental Management Plan
			Technical Schedule IX: Safety Plan
			Technical Schedule X: Functional Guarantees of the Plant
			Technical Schedule XI: Statement of Deviations from the Technical Specifications
Volume-3	**Drawings**	**Section - 8**	Drawings
Volume -4	**Price Schedule**	**Section -9**	Price Schedule

LIST OF DRAWINGS

S.No	Drawing Title	Drawing No.	Rev. No.
	50 MLD capacity STP at Kadabeesanahalli		
1	Process Flow Diagram (50 MLD capacity STP at Kadabeesanahalli)	TCE.13052A-CV-3008-SL-30000B	P0
2	Overall Plant Layout with Contours (50 MLD capacity STP at Kadabeesanahalli)	TCE.13052A-CV-3008-SL-30200	P0
3	Single Line Diagram for the Electrical Works (50 MLD capacity STP at Kadabeesanahalli)	TCE.13052A-EL-4001-AU-40011	P0
4	Single Line Diagram for the Electrical Works (50 MLD capacity STP at Kadabeesanahalli)	TCE.13052A-EL-4001-AU-40012	P0
5	Single Line Diagram for the Electrical Works (50 MLD capacity STP at Kadabeesanahalli)	TCE.13052A-EL-4000-AU-40013	P0
6	Single Line Diagram for the Electrical Works (50 MLD capacity STP at Kadabeesanahalli)	TCE.13052A-EL-4000-AU-40014	P0
7	Single Line Diagram for the Electrical Works (50 MLD capacity STP at Kadabeesanahalli)	TCE.13052A-EL-4000-AU-40015	P0
8	Single Line Diagram for the Electrical Works (50 MLD capacity STP at Kadabeesanahalli)	TCE.13052A-EL-4000-AU-40016	P0

TITLE: PROCESS FLOW DIAGRAM

DWG NO: TCE.13052A-CV-3008-SL-30000B

RAW SEWAGE

OCU-1

INLET CHAMBER

TRASH SCREEN

TROLLY

SCREENED MATERIAL FOR DISPOSAL

COARSE SCREEN

TROLLY

SCREENED MATERIAL FOR DISPOSAL

WET WELL

OVERFLOW BYPASS

BYPASS

OCU-2

SCREENED MATERIAL FOR DISPOSAL

TROLLY

GRIT DISPOSAL

TROLLY

GRIT WASHING

BYPASS

BYPASS

TO SCUM PIT

INLET CHAMBER

FINE SCREENS CHANNEL

VORTEX GRIT CHAMBER

PARSHALL FLUME

PLATE SETTLER

PROCESS AIR

SBR TANK

ALUM DOSING

SBR

DISC FILTER BYPASS

DISC FILTER

BACK WASH

BACK WASH RETURN

CHLORINE

CHLORINE CONTACT TANK

OUTFALL STRUCTURE

EXISTING JACKWELL

FINAL DISPOSAL

TREATED WATER STORAGE

TO DISC FILTER BACKWASH

TO PLANT UTILITIES

FOR TANKER FILLING

THICKENER DILUTION WATER

RO PLANT

SEPTIC TANK

WASTE WATER FROM ADMIN BUILDING

DRAIN FROM ALL PROCESS BUILDINGS

PLAN DRAIN SUMP

DILUTION WATER

POLY DOSING

THICKENER DISTRIBUTION CHAMBER

WAS

WAS SLUDGE FROM EXISTING 50 MLD KADUBEESANAHALLI STP

FROM PLATE SETTLER

SCUM PIT

OCU-3

COOLING WATER OUT

TO INTERNAL ELECTRICAL DISTRIBUTION

COOLING SYSTEM

CHEMICAL

EXHAUST GAS

HOT WATER

CHIMNEY WITH HEAT RECOVERY

BIOGAS ENGINE

BIOGAS DRYING SYSTEM

BIOGAS SCRUBBER

COOLING WATER IN

DROPLET SEPARATOR

OVERFLOW TO PLANT DRAIN SUMP

SLUDGE THICKENER

CENTRIFUGE FEED SUMP

POLYMER DOSING

CENTRIFUGE

CAKE HOPPER AND CONVEYOR

TROLLY

SLUDGE FOR DISPOSAL

GAS MIX

GAS HOLDER

WATER SEALING

SLUDGE DIGESTOR

HOT WATER IN

HEAT EXCHANGER

HOT WATER OUT

BOILER

GAS

HEAVY OIL

VOLUME MIXING

BIOGAS FLARE

DRAIN

HOT WATER STORAGE TANK

RO STORAGE TANK

FOR COOLING AND HOT WATER SYSTEM

POTABLE USE

FROM PUBLIC WATER SUPPLY

BREAK TANK

OVER HEAD TANK

FOR TENDER PURPOSE ONLY

	SIGN.												
	INITIALS												
	REVISIONS												
	SIGN.												
	INITIALS												
	REVISIONS												
PO	SIGN.												
	INITIALS												
ISSUE		DRN	DSN	CHD	CV	EL	IC	ME	CLEARED		PE/PM	APPD	DATE

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 50 MLD CAPACITY STP AT KADABEESANAHALLI

DWG NAME: PROCESS FLOW DIAGRAM

TATA CONSULTING ENGINEERS LIMITED

SCALE : NTS | DC & DISC : BLR-CV | DWG NO. TCE.13052A-CV-3008-SL-30000B | ISSUE P0 | SIZE-A1

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FILE NAME : PFD (50 MLD Kadabeesanahalli).dwg

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

DWG NO: TCE.13052A-CV-3008-SL-30200

TITLE: OVERALL PLANT LAYOUT WITH CONTOURS

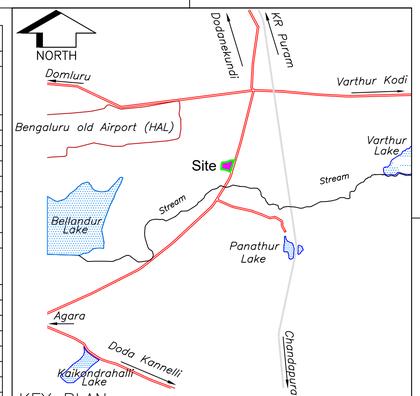
KADUBEESANAHALLI TSPS COMPONENT LIST							
SI NO.	COMPONENT NAME	NO. OF UNITS	SIZE IN METERS				
	TERMINAL SEWAGE PUMPING STATION (TSPS)		L	W	LD*/H	DIA	Free board (m)
01	TSPS INLET CHAMBER	1	3.60	6.30	1.20	–	0.75m Above FGL
02	TRASH SCREEN & COARSE SCREEN CHANNEL	3	10.00	1.70	1.00	–	0.75m Above FGL
03	COARSE SCREEN EFFLUENT CHANNEL	1	1.50	6.30	0.90	–	0.75m Above FGL
04	WET WELL	1	–	–	2.20	15.10	0.75m Above FGL
05	PUMPING HOUSE (ABOVE WET WELL)	1	–	–	5.50	15.10	–
06	VALVE CHAMBER	2	11.00	2.50	2.00	–	–
KADUBEESANAHALLI 50MLD STP COMPONENT LIST							
SI NO.	COMPONENT NAME	NO. OF UNITS	SIZE IN METERS				
	SEWAGE TREATMENT PLANT (STP)		L	W	LD*/H	DIA	Free board (m)
07	STP INLET CHAMBER	1	3.00	9.00	1.50	–	0.50
08	FINE SCREEN CHANNEL	3	7.00	2.20	1.10	–	0.50
09	FINE SCREEN EFFLUENT CHANNEL	1	1.50	9.00	1.00	–	0.50
10	GRIT CHAMBER	3	–	–	1.50	4.20	0.50
11	PARSHALL FLUME CHANNEL	1	20.00	1.80	0.80	–	0.50
12	PRIMARY CLARIFIER FLOW DISTRIBUTION BOX	1	6.00	3.80	1.80	–	0.50
13	PRIMARY CLARIFIER WITH PLATE SETTLERS	4	14.00	14.00	4.30	–	0.50
14	PRIMARY SLUDGE PUMP HOUSE	1	15.00	10.00	5.50	–	–
15	SBR FLOW DISTRIBUTION BOX	1	5.60	4.00	1.80	–	0.50
16	SBR TANKS	4	39.00	37.50	6.00	–	0.60
17	SBR BASIN EFFLUENT CHANNEL	1	–	1.40	0.80	–	0.50
18	DISK FILTER FLOW DISTRIBUTION BOX	1	6.00	3.60	1.40	–	0.50
19	DISC FILTER INFLUENT AND EFFLUENT CHANNEL	1	10.20	1.80	0.70	–	0.50
20	DISC FILTER	2	8.00	3.00	1.50	–	0.50
21	DISC FILTER BYPASS CHANNEL	1	8.00	1.80	0.70	–	0.50
22	DISC FILTER BUILDING(ABOVE DISK FILTER)	1	8.00	10.20	5.50	–	RCC framed stilt structure
23	CCT FLOW DISTRIBUTION BOX	1	6.00	3.60	1.40	–	0.50
24	CHLORINE CONTACT TANK	3	26.70	6.50	2.00	–	0.50
25	CCT EFFLUENT CHANNEL	1	21.00	1.80	0.70	–	0.50
26	BLOWER BUILDING(INCLUDING ELECTRICAL PANEL)	1	23.00	13.00	9.00	–	–
27	CHEMICAL BUILDING	1	12.00	11.00	5.50	–	–
28	CHLORINATION BUILDING(ABOVE CCT)	1	20.50	14.00	5.50	–	–
29	SLUDGE BALANCING/FLOW DISRTIBUTION BOX TO THICKENER	1	9.00	9.00	3.00	–	0.50
30	GRAVITY SLUDGE THICKENER	2	–	–	4.20	25.0	0.50
31	SLUDGE THICKENED BUILDING	1	15.00	12.00	6.50	–	–
32	ANAEROBIC SLUDGE DIGESTOR	2	–	–	10.00	30.5	–
33	DIGESTER BUILDING	1	20.00	12.00	6.00	–	G+2
34	BIOGAS STORAGE TANKS	2	–	–	8.00	16.0	–
35	BIOGAS SCRUBBING AREA	1	12.00	9.00	–	–	–
36	BIOGAS SCRUBBING BLOWER BUILDING	1	9.00	8.00	7.50	–	–
37	BIOGAS FLARE AREA	1	12.00	6.00		–	–
38	CENTRIFUGE FEED SUMP	1	8.00	12.00	3.50	–	Top of sump shall be same as the digester water level
39	CENTRIFUGE FEED PUMP HOUSE	1	8.00	9.00	5.50	–	–
40	CENTRIFUGE BUILDING(G+1)	1	8.00	9.00	5.50	–	–
41A&B	SECONDARY SCUM PIT	2	–	–	2.00	8.00	2.00
42A&B	PLANT DRAIN SUMP	2	–	–	2.00	9.00	2.00
43	TREATED WATER STORAGE	1	9.00	7.00	3.00	–	1.00
44	RO BUILDING	1	10.00	7.00	5.50	–	–
45A&B	TRANSFORMER YARD	2	12.00	7.00	–	–	–
46A&B	ELECTRICAL SUB STATION(TSPS/STP)	2	20.00	15.00	5.50	–	–
47A&B	PLANT DG ROOM	2	15.00	12.00	6.50	–	–
48A&B	STORE/TOOL/MAINTENANCE WORKSHOP	2	12.00	10.00	6.00	–	–
49	ADMIN BUILDING INLUDES PLC SCADA,LABORATORY(G+1)	1	15.00	12.00	4.50	–	–
50	PARKING SHED	1	15.00	6.00	4.50	–	–
51	GUARD ROOM(SECURITY ROOM)	1	3.00	3.00	3.00	–	–
52	OUTFALL CHAMBER	1	3.00	3.00	1.50	–	–
53	OVERFLOW CHAMBER	3	2.00	2.00	1.50	–	0.50
54	ODOUR CONTROL ROOM(OCU 1) NEAR TSPS	1	8.00	5.00	6.00	–	–
55	OCU 2 (Near Preliminary treatment units)	1	8.00	5.00	6.00	–	–
56	OCU 3 (Near Sludge handling units)	1	8.00	5.00	6.00	–	–
57	BIOGAS ENGINE ROOM	1	15.00	12.00	6.50	–	–
58	PROPOSED RCC BRIDGE	1	30.00	5.00	–	–	–

LIST OF POINTS

POINTS	EASTING	NORTHING	RL
BASE1	792779.216	1432733.637	871.257
SBM3	792525.221	1432533.598	868.528
SBM4	792528.602	1432554.180	868.523

HFL : 868.43

NOTE NO.15 :-THE CONTRACTOR SHALL VISIT THE SITE TO ASSESS THE EXISTING SLUDGE DRYING BEDS, EMPLOYER OFFICE BUILDING AND ANY OTHER STRUCTURE(S) FOR COMPLETE DEMOLITION IN LINE WITH TENDER REQUIREMENTS TO ACCOMMODATE THE PROPOSED STP UNITS AS SHOWN IN THIS LAYOUT.



KEY PLAN

LEGENDS:

- RAW SEWAGE PIPE
- SLUDGE PIPE
- SUPERNATANT PIPE
- TREATED WATER
- (10) PROPOSED STP UNITS
- PROPOSED PRECAST RCC COMPOUND WALL
- PROPOSED RCC RETAINING WALL
- ROAD TO BE RESTORED AFTER COMPLETING CONSTRUCTION ACTIVITIES
- BYPASS LINE
- SCUM PIPE
- PROPOSED ROAD
- EXISTING ROAD
- GAS LINE
- DRAIN;NALA
- EXISTING FENCE;EXISTING BUILDING

NOTES:

1. ALL LEVELS ARE IN METERS,UNLESS OTHER WISE MENTIONED.
2. ALL LEVELS ARE WITH REFERENCE TO THE GTS BENCH MARK ENGRAVED ON CENTER OF 2ND STONES ON EAST SIDE OF QUEEN VICTORIA'S STATUE IN CUBBON PARK,BANGALORE.ITS VALUE IS 912.266M.
3. ALL THE CO-ORDINATES ARE BASED ON UTM WGS-84.
4. ALL THE PROCESS AND NON-PROCESS BUILDING DIMENSIONS SHOWN ARE MINIMUM AND HEIGHT OF THE BUILDING SHALL BE FROM FINISHED FLOOR LEVEL TO THE BOTTOM OF THE ROOF BEAM.
5. FINISHED FLOOR LEVEL OF ALL PROCESS AND NON PROCESS BUILDING SHALL BE ATLEAST 500MM ABOVE THE FINISHED GROUND LEVEL.
6. FINISHED GROUND LEVEL (FGL) OF THE STP SHALL BE MINIMUM 500MM ABOVE THE HFL.
7. ALL THE BUILDING DIMENSIONS (OR AREA WHEN CALCULATED) SHOWN ARE MINIMUM. HOWEVER, CONTRACTOR MAY UPSIZE THESE DIMENSIONS (OR AREA WHEN CALCULATED) BASED ON HIS DESIGN TO MEET THE SPECIFIED TENDER REQUIREMENTS.
8. CONTRACTOR HAS TO PROPOSE A PILE FOUNDATION FOR ALL PROCESS UNITS INCLUDING FOR ALL TYPES OF BUILDINGS AS A PART OF THE FOUNDATION DESIGN OF THIS STP
9. TOTAL LENGTH OF PROPOSED 5m WIDE ROAD = 510m
10. TOTAL LENGTH OF PROPOSED RCC PRECAST COMPOUND WALL = 455m
11. TOTAL LENGTH OF PROPOSED RCC RETAINING WALL = 150m

Area Details

12.Total area of Existing STP=65219.93 SQMS (16.12 Acres)
13.Area of Proposed STP within Existing STP=17092.19 SQMS (4.22 Acres)
14.Area of Proposed STP =20350 SQMS (5.03 Acres)

	SIGN.											
	INITIALS											
	REVISIONS											
	SIGN.											
	INITIALS											
	REVISIONS											
PO	SIGN.											
	INITIALS											
ISSUE		DRN	DSN	CHD	CV	EL	IC	ME	CLEARED	PE/PM	APPD	DATE

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FILE NAME : LAYOUT (50 MLD Kadabeesanahalli).dwg

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 50MLD CAPACITY STP AT KADABEESANAHALLI

DWG NAME: OVERALL PLANT LAYOUT WITH CONTOURS

TATA CONSULTING ENGINEERS LIMITED

SCALE	DWG NO.	ISSUE
: NTS	TCE.13052A-CV-3008-SL-30200	P0
DC & DISC : BLR-CV		SIZE-A1

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 50MLD STP, KADUBEESENAHALLI

DWG NO: TCE.13052A-EL-4001-AU-40011

INCOMERS FROM THE FROM NEAREST KPTCL/BESCOM SUBSTATION

11kV Al. CONDUCTOR, XLPE, ARM. UNDER GROUND CABLE

3 WAY RMU (DAS)
11kV, 630A, 350 MVA
(2 OD + 1VL)
(AS PER BESCOM SPECS.)

11kV, 630A ISOLATOR+ES

11kV, 630A ISOLATOR+ES

11kV, 630A VCB

11kV, AL ARMOURED XLPE CABLE

METERING CUBICLE
11KV, 3 CT & 3 PT
(AS PER BESCOM SPECS.)

TTB TVM

BESCOM'S SCOPE

PROPOSED WORKS UNDER CONTRACTOR'S SCOPE

11KV OUTDOOR VCB PANEL

11kV VCB

11kV, AL ARMOURED XLPE UNEARTHED CABLE

11kV METAL ENCLOSED SWITCHBOARD
LOC: 11kV HT ROOM

TO TRAFO OUTGOING

VSS+DV R Y B

MCB

BUS PT
11kV/110V/110V
CL.-0.5 (METERING)
CL.-3P (PROTECTION)

Line PT-1
11kV/110V/110V
CL.-0.5 (METERING)
CL.-3P (PROTECTION)

SA

MCB

MCB

VSS+DV R Y B

PROTECTION CT CL:5P20
R 50,50N,51,51N,27,50BF,95,94
NUMERICAL RELAY PLC

METERING CT CL:1
MFM ASS+DA

11kV VCB INCOMER

86

(ON I/C FEEDER)
BON BOFF T TCH SC
DCF RC BS BT ACF

11kV, 3PH, 50HZ, TP, CU BUSBAR, 26.25kA FOR 1SEC

11kV VCB 86 50,50N,51,51N,49,24,50BF 94,WTI,OTI,BR,OSR,PRV 51NS,46

(ON O/G FEEDER)
95 94 86
BON BOFF T TCH SC
DCF RC BS BT ACF

11kV VCB 86 50,50N,51,51N,49,24,50BF 94,WTI,OTI,BR,OSR,PRV 51NS,46

METERING CT CL:1 MFM

PROTECTION CT CL:5P20 R 50/51 50N

N.RELAY PLC

SA

PLC

TRANSFORMER ANNUNCIATION (TYP)

METERING CT CL:1 MFM

PROTECTION CT CL:5P20 R 50/51 50N

N.RELAY PLC

SA

11kV, AL ARMOURED XLPE UNEARTHED CABLE

MARSHALLING BOX(TYP)

11kV, AL ARMOURED XLPE UNEARTHED CABLE

TR-1, 11kV/433V, ONAN, Z=% AS PER IS:1180, DYN11, OUTDOOR PLINTH MOUNTED WITH WTI, OTI, BR, MOG, OSR PRV WITH TAP CHANGER INDICATION WITH +5% TO -15% TAPS IN STEPS OF 2.5%

R 51NS R 64R

NON - SEGREGATED TPN ALUMINIUM BUSDUCT

TR-2, 11kV/433V, ONAN, Z=% AS PER IS:1180, DYN11, OUTDOOR PLINTH MOUNTED WITH WTI, OTI, BR, MOG, OSR PRV WITH TAP CHANGER INDICATION WITH +5% TO -15% TAPS IN STEPS OF 2.5%

R 51NS R 64R

NON - SEGREGATED TPN ALUMINIUM BUSDUCT

NON - SEGREGATED TPN ALUMINIUM BUSDUCT

DG ROOM

415V DG SET#03 WITH AMF CONTROL PANEL

415V DG SET#04 WITH AMF CONTROL PANEL

G G

1.1kV XLPE AL ARMOURED CABLE

DG PCC#01 SUB-STATION BUILDING

TPN 1250A ACB

TPN 1250A ACB

TPN 2500A ACB

415V PCC # 01
LOC: SUB-STATION BUILDING

ON MCCB
ON OFF TRIP

ON ACB
BON BOFF
TCH SC T RC

PROTECTION CT CL:5P20 R

MCB R Y B

METERING CT CL.-1.0 3 1 MFM TO PLC (RS485)

EDO,ACB,TPN WITH MICROPROCESSOR RELEASE FOR O/C, E/F, UV & S/C

INCOMER-1 NC

BUS-1

BUS-2

I/L N0

INCOMER-2 NC

DG INCOMER NO

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

FUSE 415/230V AC TR MCB DP

TPN ACB

TPN MCCB

BUSCOUPLER SAME AS INCOMER

KVAr APFCR

1.1kV XLPE CU/AL ARMOURED CABLE

FOR FEEDERS CONTROL SUPPLY
TSPS MCC
RTCC PANEL
BATTERY CHARGER
SPARE
MLDB
EFDB SS BLDG
EFDB DG BLDG.
SPARE
CAPACITOR BANK WITH APFC
CAPACITOR BANK WITH APFC
CHLORINE MCC
RAS MCC
SPARE
CENTRIFUGE MCC
RTCC PANEL
SPARE
HEADWORKS MCC
SPARE
FOR FEEDERS CONTROL SUPPLY
SPARE

LEGENDS:-

(R) RELAYING

50	INSTANTANEOUS PHASE OVER CURRENT RELAY SUFFIX N- GROUND
51	INVERSE DEFINITE MINIMUM TIME OVER CURRENT RELAY SUFFIX N- GROUND, SUFFIX NS-STANDBY EARTH
95	TRIP CIRCUIT SUPERVISION RELAY
94	ANTI-PUMPING RELAY
27	UNDER VOLTAGE RELAY
86	LOCKOUT RELAY (HAND RESET)
OSR	OIL SURGE RELAY
PRV	PRESSURE RELEASE VALVE
50BF	BREAKER FAIL
46	REVERSE PHASE/UNBALANCE
24	VOLTS PER HERTZ RELAY
49	TRANSFORMER THERMAL RELAY
64R	RESTRICTED EARTH FAULT PROTECTION RELAY

- 3-PH DISTRIBUTION TRANSFORMER
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- CABLE TERMINATION
- 415V DRAW OUT TYPE AIR CIRCUIT BREAKER
- 11kV DRAW OUT TYPE VACUUM CIRCUIT BREAKER
- 415V MOULDED CASE CIRCUIT BREAKER
- 415V MINIATURE CIRCUIT BREAKER
- BREAKER CONTROL SWITCH
- INDICATING LAMP

- M MOTOR
- STAR-DELTA STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- DIRECT ONLINE STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- G DG SET WITH AMF CONTROL PANEL
- TCH TRIP CIRCUIT HEALTHY INDICATION (WHITE LED)
- SCC SPRING CHARGED INDICATION (BLUE LED)
- BON BREAKER ON INDICATION (RED LED)
- BOFF BREAKER OFF INDICATION (GREEN LED)
- DCF TRIPPED ON FAULT INDICATION (AMBER LED)
- BS DC SUPPLY FAIL INDICATION (AMBER LED)
- BT BREAKER IN SERVICE POSITION (RED LED)
- ACF BREAKER IN TEST POSITION (CLEAR LED)
- ON AC SUPPLY FAIL INDICATION (AMBER LED)
- ON ON INDICATION (RED LED)

- OFF OFF INDICATION (GREEN LED)
- TRIP TRIP INDICATION (AMBER LED)
- R R-PHASE INDICATION LAMP (RED LED)
- Y Y-PHASE INDICATION LAMP (YELLOW LED)
- B B-PHASE INDICATION LAMP (BLUE LED)
- LOCAL/OFF/REMOTE SELECTOR SWITCH
- SA SURGE ARRESTER
- ASS+DA DIGITAL AMMETER WITH BUILT IN SELECTOR SWITCH
- VSS+DV DIGITAL VOLTMETER WITH BUILT IN SELECTOR SWITCH
- 415V, FIXED TYPE MOTOR PROTECTION CIRCUIT BREAKER (MPCB)
- ICP INSTRUMENTATION CONTROL PANEL
- N.RELAY NUMERICAL RELAY
- MFM MULTI FUNCTION METER WITH RS485 COMMUNICATION (AMMETER, VOLTMETER, PF, FREQUENCY)
- PLC PROGRAMMABEL LOGIC CONTROLLER

- MPR COMPREHENSIVE MOTOR PROTECTION RELAY
- M METERING UNIT
- CAPACITOR BANK
- LCSP LOCAL CONTROL STARTER PANEL
- TTB(CT SHORT LINK)
- SS SOFT STARTER
- ISO LOCAL ISOLATOR SWITCH
- RC READY TO CLOSE (CLEAR LED)
- LCP LOCAL CONTROL PANEL
- CONTROL TRANSFORMER
- TR
- I/L INTER LOCK

INTERLOCK:

INCOMER-1	INCOMER-2	BUS COUPLER	DG
ON	ON	OFF	OFF
ON	OFF	ON	OFF
OFF	OFF	ON	ON
OFF	ON	ON	OFF

NOTES:

1. TRIP COIL CIRCUITS OF ALL CIRCUIT BREAKERS SHALL BE PROVIDED WITH TRIP SUPERVISION RELAY TO SUPERVISE THE CIRCUIT IN BOTH OPEN AND CLOSED POSITION OF CIRCUIT BREAKERS.
2. ALL RELAYS USED IN 11kV SWITCHGEAR SHALL BE NUMERICAL TYPE.
3. AMMETERS IN MOTOR FEEDERS SHALL BE PROVIDED WITH SUPPRESSED SCALE UP TO 6 TIMES FULL LOAD CURRENT FOR INDICATION STARTING CURRENT.
4. ACB's SHALL BE PROVIDED WITH MICROPROCESSOR RELEASES FOR ADJUSTABLE OVERLOAD SHORT CIRCUIT, UNDER VOLTAGE AND EARTH FAULT FOR LT BREAKER. VCB'S SHALL BE PROVIDED WITH SHUNT TRIP COILS RATED WITH 110V DC FOR HT BREAKER.
5. MCCB's SHALL BE PROVIDED WITH ELECTRONIC RELEASES FOR ADJUSTABLE OVERLOAD, SHORT CIRCUIT AND EARTH FAULT.
6. ALL PANEL WIRING SHALL BE WITH 1100 VOLTS GRADE PVC INSULATED 1.5 Sqmm STRANDED COPPER WIRE FOR CONTROL WIRING & 2.5 Sqmm FOR CT SECONDARY WIRING.
7. ALL CT'S SHALL BE OF 5A SECONDARY.
8. ALL CONTACTOR/TIMERS etc., SHALL BE RAIL MOUNTED.
9. MINIMUM CONTACTOR RATING SHALL BE 16A.
10. CONTROL SUPPLY SHALL BE 240V AC TAPPED BETWEEN PHASE AND NEUTRAL FEEDERS MODULES.
11. MPCB SHALL BE WITH IN BUILT SINGLE PHASING PREVENTER.
12. ALL CONTACTORS SHALL BE OF AC 3 DUTY.
13. WIDTH OF FEEDER COLOUMN SHALL BE MINI 500 mm CABLE ALLEY SHALL BE 300mm MINI.
14. ALL ACB, MCCB, CONTACTORS, MPCB, & MPR SHALL BE OF TYPE-2 CO-ORDINATION.
15. LCP SHALL BE AS INDICATED IN P&ID.
16. CT RATIO SHALL BE 20% MORE THAN THE FLC 0.85PF & 0.9 EFFICIENCY.
17. CABLE COMPARTMENT SHALL HAVE LED LAMP INTERLOCKED WITH DOOR.
18. ALL INDICATION LAMP SHALL HAVE LED CLUSTER TYPE.
19. ALL MCCB SHALL HAVE EXTENDED ROTORY HANDLE & EXTENDED BUSBAR LINK
20. OPERATION LOGIC OF 415V SWITCHBOARD:
(A) AT NORMAL CONDITION BOTH THE TRANSFORMER INCOMER FEEDER SHALL BE IN CLOSED POSITION. THE BUS COUPLER AND DG INCOMER IN OPEN POSITION.
(B) IN CASE OF FAULTS, THE FAULTY INCOMER FEEDER SHALL BE OPEN POSITON THE BUS COUPLER AND THE HEALTHY INCOMER FEEDER SHALL BE CLOSED POSITON.
(C) IN CASE OF POWER FAILURE, THE DG INCOMER, BUS COUPLER SHALL BE IN CLOSED POSITION. BOTH THE TRANSFORMER INCOMER SHALL BE SWITCHED OFF BY ACTIVATION OF UNDER VOLTAGE RELAY OF THE GRID INCOMER.
21. MOTOR FEEDER <5.5kW WILL HAVE DIRECT CONNECTED AMMETER IN Y PHASE, MOTORS >5.5kW UPTO 15kW WILL BE PROVIDED WITH 1 CT AND AMMETER AND MOTOR >15kW AND ABOVE WILL BE PROVIDED WITH 3 CTS AND AMMETER.
22. NECESSARY INTERLOCK TO SPACE HEATER WITH MOTORS TO BE PROVIDED.
23. ALL MCB SHALL HAVE KW = 100% Ics.
24. ALL MCCB CONNECTED TO MOTOR SHALL BE RATED TO MOTOR DUTY.
25. ALL ACB SHALL HAVE Icu = Ics = Icw.
26. THE 415V SIDE OF THE TRANSFORMER IS PROVIDED WITH NON SEGREGATED ALUMINUM BUS DUCT IF THE TRANSFORMER RATING IS GREATER THAN OR EQUAL TO 1000KVA. FOR THE TRANSFORMER RATING IS LESS THAN 1000KVA XLPE AL ARMOURED CABLE SHALL BE PROVIDED ON 415V SIDE.
27. CABLE SIZES LESS THAN OR EQUAL TO 6 Sqmm SHALL BE PROVIDED WITH COPPER CONDUCTORS AND AL CONDUCTORS TO BE USED FOR CABLE SIZES ABOVE 6 Sqmm.
28. CAPACITOR BANK WITH APFC SHALL BE PROVIDED WITH INTERLOCK SUCH THAT PANELS ARE FED BY DG SET, CAPACITOR BANK SHALL BE DISCONNECTED.
29. 20% SPARE FEEDERS WITH MINI OF 1 SPARE FEEDER FOR EACH RATING OF THE OUTGOING FEEDERS SHALL BE PROVIDED IN LT PANELS (PCC/MCC).
30. PORTABLE TYPE STARTER WILL BE PROVIDED FOR GATES.

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					CLEARED							

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 50 MLD CAPACITY STP AT KADABEESANAHALLI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 01 OF 06

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FILE NAME : SLD (50 MLD Kadabeesanahalli).dwg

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

SCALE : NTS | DWG NO. TCE.13052A-EL-4001-AU-40011 | ISSUE P0

DC & DISC: BLR-EL

SIZE-A1

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 50MLD STP, KADUBEESENAHALLI

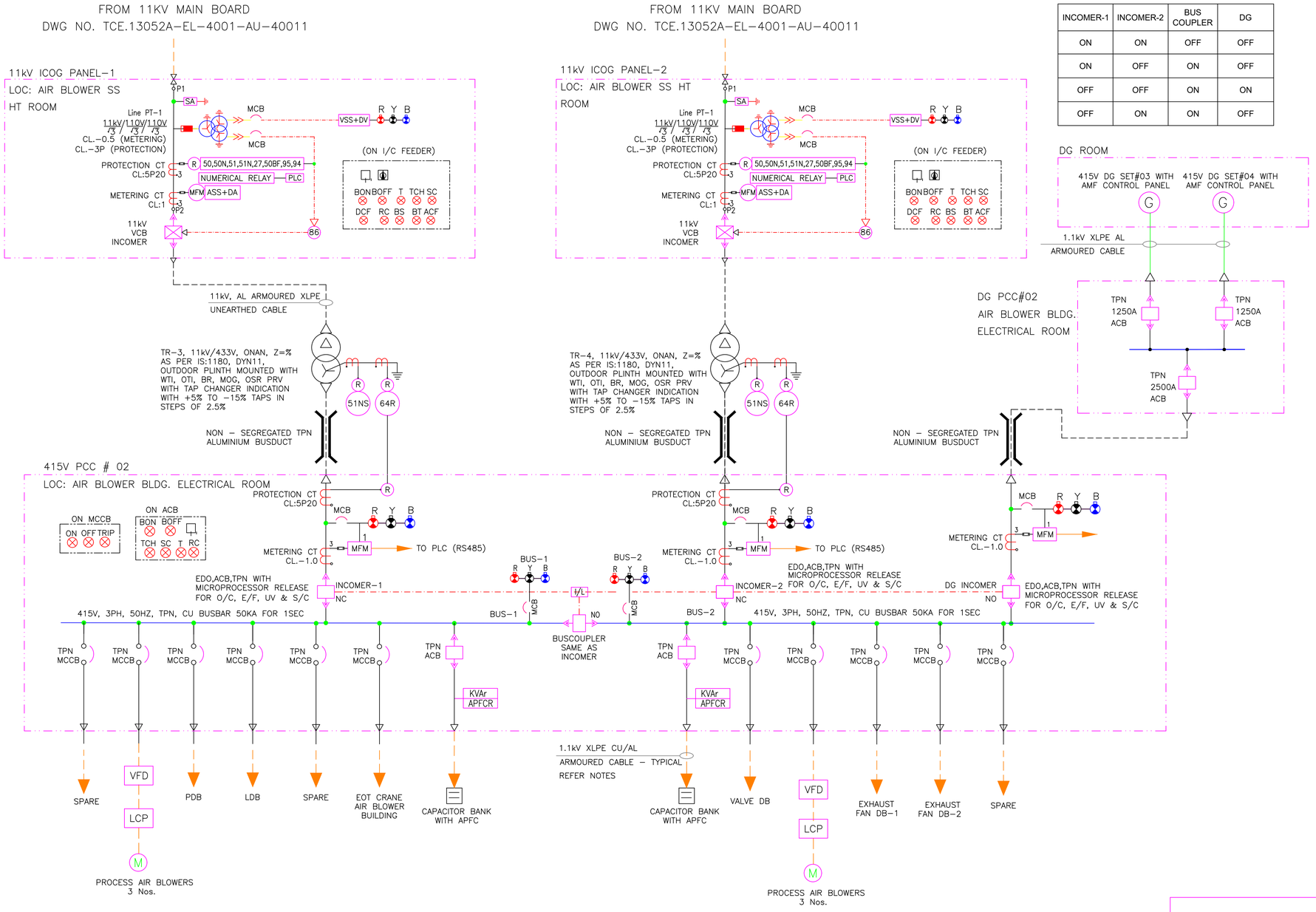
DWG NO: TCE.13052A-EL-4001-AU-40012

NOTES:-

1. FOR GENERAL NOTES, LEGENDS, REFER DRAWING NO. TCE.13052A-EL-4001-AU-40011.

INTERLOCK:

INCOMER-1	INCOMER-2	BUS COUPLER	DG
ON	ON	OFF	OFF
ON	OFF	ON	OFF
OFF	OFF	ON	ON
OFF	ON	ON	OFF



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PO	SIGN.											
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ISSUE		DRN	DSN	CHD	CV	EL	IC	ME		PE/PM	APPD	DATE
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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 50 MLD CAPACITY STP AT KADABEESANAHALLI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 02 OF 06

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FILE NAME : SLD (50 MLD Kadabeesanahalli).dwg

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

SCALE	DWG NO.	ISSUE
: NTS	TCE.13052A-EL-4001-AU-40012	P0
DC & DISC : BLR-EL		

SIZE-A1

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 50MLD STP, KADUBEESENAHALLI

DWG NO: TCE.13052A-EL-4000-AU-40013

NOTES:-

1. FOR GENERAL NOTES, LEGENDS, REFER DRAWING NO. TCE.13052A-EL-4001-AU-40011.

415V PCC # 01

CENTRIFUGE MCC
LOC: CENTRIFUGE BUILDING

ON_MCCB: ON OFF TRIP
ON_MPCB: ON OFF

MCB R Y B
METERING CT CL.-1.0
MFM → TO PLC (RS485)
TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MCCB	TPN MCCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MCCB	TPN MCCB	VFD	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MPCB	TPN MCCB	TPN MCCB	VFD	TPN MPCB	TPN MCCB	TPN MPCB	TPN MPCB
LCP	LCP	LCP	LCP	LCP	LCP	LCP									LCP			LCP	LCP		LCP	LCP	
SPARE 2 Nos.		PLANT DRAIN PUMPS 2 Nos.	CENTRIFUGE FEED SUMP MIXER 2 No.	POLYMER SYSTEM 4 Nos.	DEWATERED SLUDGE CONVEYOR 1 No.	POLYMER DOSING PUMPS 4 Nos.	CENTRIFUGE FEED PUMPS 4 Nos.	ODOUR CONTROL UNIT-3	CENTRIFUGE CONTROL PANEL 4 NOS.	MOT. HOIST CENTRIGUGE BLDG. 1 NO.	EOT CRANE 1 No. CENTRIFUGE FEED PH	FOR EXHAUST FAN DB - 4 NOS.	FOR POWER RECEPTACLES	FOR VALVE DB		SPARE 2 Nos.	SPARE 2 Nos.		DIGESTER FEED PUMPS 4 Nos.	GRAVITY SLUDGE THICKENER 2 No.	DILUTION WATER PUMPS 3 Nos.	CENTRIFUGE FEED SUMP MIXER 2 No.	AUTO POLYMER SYSTEM 3 Nos.

1.1kV XLPE CU/AL
ARMOURED CABLE - TYPICAL
REFER NOTES

415V PCC # 01

TSPS MCC
LOC: TSPS PUMP HOUSE

ON_MCCB: ON OFF TRIP

MCB R Y B
METERING CT CL.-1.0
MFM → TO PLC (RS485)
TPN ACB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MPCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB
LCP	LCP				VFD						
SPARE 1 No.	DEWATERING PUMPS 4 Nos.	MOTORIZED MONORAIL HOIST 2 Nos.	FOR EXHAUST FAN DB	TSPS PUMPS 6 Nos.	FOR POWER RECEPTACLES	FOR VALVE DB	SPARE 2 Nos.	ODOUR CONTROL UNIT-1 (NEAR TSPS)	SPARE 1 No.		

1.1kV XLPE CU/AL
ARMOURED CABLE - TYPICAL
REFER NOTES

CENTRIFUGE MCC
LOC: CENTRIFUGE BUILDING

ON_MCCB: ON OFF TRIP
ON_MPCB: ON OFF

TPN MPCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB
	VFD	VFD				
LCP	LCP	LCP	LCP	LCP	LCP	LCP
MIXER IN SLUDGE BALANCING 1 No.	POLYMER DOSING PUMPS 3 Nos.	CENTRIFUGE FEED PUMPS 3 Nos.	PLANT WATER PUMPS 3 Nos.	TREATED WATER PUMPS 2 Nos.	SPARE 2 Nos.	SCUM TRANSFER PUMPS 2 Nos.

COARSE SCREEN CONTROL PANEL

1.1kV XLPE CU/AL
ARMOURED CABLE - TYPICAL
REFER NOTES

MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	
SCREENING CONVEYOR WITH SCREENING COMPACTOR 1 No.	MOT. VALVE	MOT. VALVE	MOT. VALVE	MOT. VALVE	TSPS COARSE SCREENS 3 Nos.	

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P0														
ISSUE								CLEARED						

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 50 MLD CAPACITY STP AT KADABEESANAHALLI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 03 OF 06

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

SCALE	DWG NO.	ISSUE
: NTS	TCE.13052A-EL-4000-AU-40013	P0

DC & DISC: BLR-EL
FILE NAME : SLD (50 MLD Kadabeesanahalli).dwg
SIZE-A1
TCE FORM NO. 091 R1
FILE NAME: F-091-Rev-R1.dwg

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 50MLD STP, KADUBESENAHALLI

DWG NO: TCE.13052A-EL-4000-AU-40014

NOTES:-

1. FOR GENERAL NOTES, LEGENDS, REFER DRAWING NO. TCE.13052A-EL-4001-AU-40011.

415V PCC # 01

HEADWORKS MCC

LOC: SUBSTATION BUILDING

ON MCCB: ON OFF TRIP

ON MPCB: ON OFF

MCB R Y B

METERING CT CL.-1.0 — 3 — MFM — 1 — TO PLC (RS485)

TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MCCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MCCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MPCB	DP MCCB	DP MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MPCB	TPN MCCB	TPN MCCB			
LCP	LCP	LCP	LCP		LCP	LCP	LCP	LCP								LCP					
FINE SCREEN PANEL	GRIT MECHANISM DRIVE 3 Nos.	GRIT TRANSFER PUMP 3 Nos.	GRIT WASHER MECHANISM 3 Nos.	GRIT DISCHARGE CONVEYOR 3 Nos.	EOT CRANE PRIMARY TREATMENT	PRIMARY SLUDGE PUMPS 6 NOS.	PRIMARY CLARIFIER 4 NOS.	SPARE	SPARE	FOR AIR CONDITIONING IN SCADA, CONTROL ROOM BUILDING 2 Nos.	FOR AIR CONDITIONING IN CONFERENCE HALL, ENGINEERS ROOM 2 Nos.	FOR EXHAUST FAN DB IN SUB-STATION BUILDING	FOR POWER RECEPTACLES	FOR VALVE DB	EOT CRANE (PRIMARY SLUDGE PH)	SPARE 2 Nos.	SPARE 2 Nos.	ODOUR CONTROL UNIT-2 (NEAR HEAD WORKS)			

1.1kV XLPE CU/AL ARMOURED CABLE - TYPICAL REFER NOTES

FINE SCREEN CONTROL PANEL

MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	
SCREENING CONVEYOR WITH SCREENING COMPACTOR 1 No.	MOT. VALVE	MOT. VALVE	MOT. VALVE	MOT. VALVE	MOT. VALVE	FINE SCREENS 3 Nos. - 3 KW

415V PCC # 01

BIO-GAS MCC

LOC: BIO-GAS SCRUBBING BLOWER BLDG.

ON MCCB: ON OFF TRIP

MCB R Y B

METERING CT CL.-1.0 — 3 — MFM — 1 — TO PLC (RS485)

TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB
				VFD			
				LCP			
				M			
BIO-GAS FLARE 2 Nos	BIO-GAS SCRUBBING SYSTEM 1 No	EOT 1 No. BIO-GAS SCRUBBING BLOWER BLDG. 1 No	FOR EXHAUST FAN DB	BIO-GAS SCRUBBING BLOWER 2 Nos.	FOR POWER RECEPTACLES	FOR VALVE DB	SPARE 2 Nos.

1.1kV XLPE CU/AL ARMOURED CABLE - TYPICAL REFER NOTES

415V PCC # 01

RAS MCC

LOC: SUBSTATION BUILDING

ON MCCB: ON OFF TRIP

ON MPCB: ON OFF

MCB R Y B

METERING CT CL.-1.0 — 3 — MFM — 1 — TO PLC (RS485)

TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MPCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MPCB	TPN MPCB	
VFD	VFD	VFD							LCP	
LCP	LCP	LCP								
M	M	M								
DECANTER 4 NOS.	RETURN ACTIVATED SLUDGE PUMPS 8 Nos.	WASTE ACTIVATED SLUDGE PUMPS 8 Nos.	EOT FOR RETIEVABLE DIFFUSER ARRANGEMENT 2 Nos.	SPARE 2 No.	FOR EXHAUST FAN DB	FOR POWER RECEPTACLES	FOR VALVE DB	SPARE 2 NOS.	SPARE 2 Nos.	

1.1kV XLPE CU/AL ARMOURED CABLE - TYPICAL REFER NOTES

1.1kV XLPE CU/AL ARMOURED CABLE - TYPICAL REFER NOTES

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	REVISIONS												
PO	SIGN.												
	INITIALS												
ISSUE		DRN	DSN	CHD	CV	EL	IC	ME		CLEARED	PE/PM	APPD	DATE

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FILE NAME : SLD (50 MLD Kadabeesanahalli).dwg

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 50 MLD CAPACITY STP AT KADABEESANAHALLI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 04 OF 06

TATA CONSULTING ENGINEERS LIMITED
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SCALE : NTS | DWG NO. TCE.13052A-EL-4000-AU-40014 | ISSUE P0

DC & DISC: BLR-EL

SIZE-A1

FILE NAME: F-091-Rev-R1.dwg

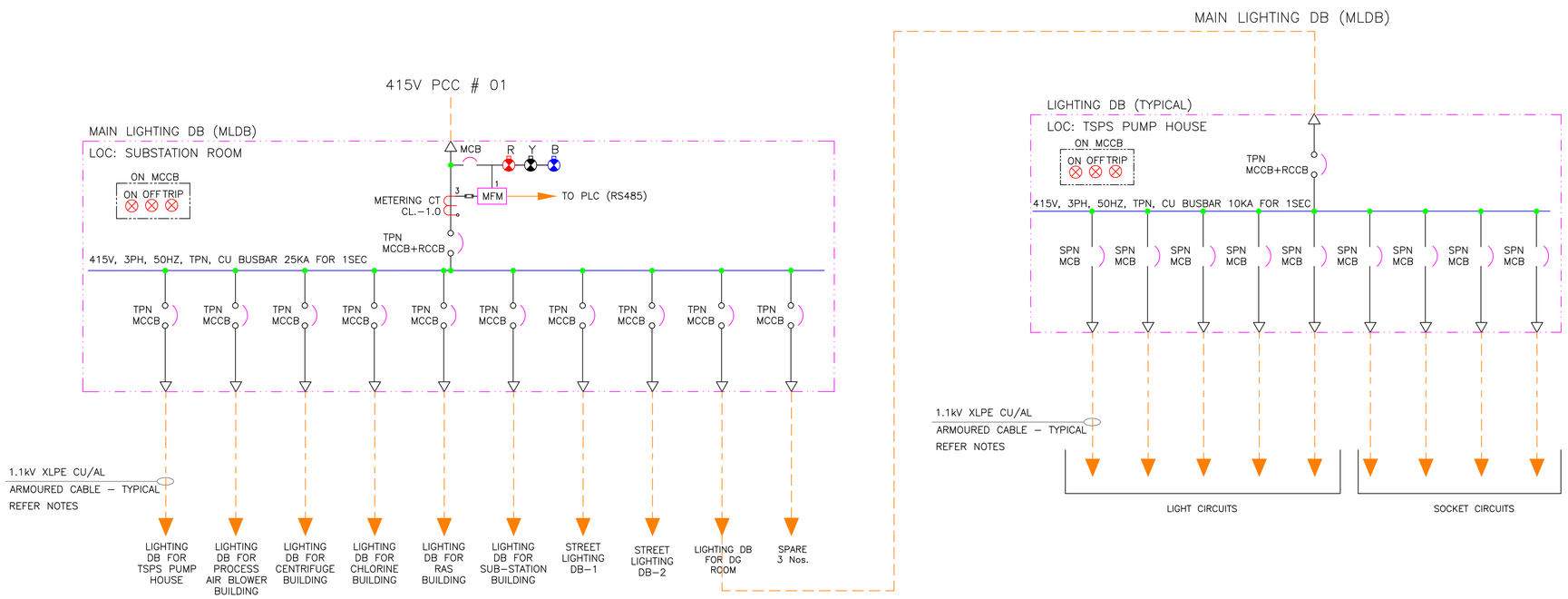
TCE FORM NO. 091 R1

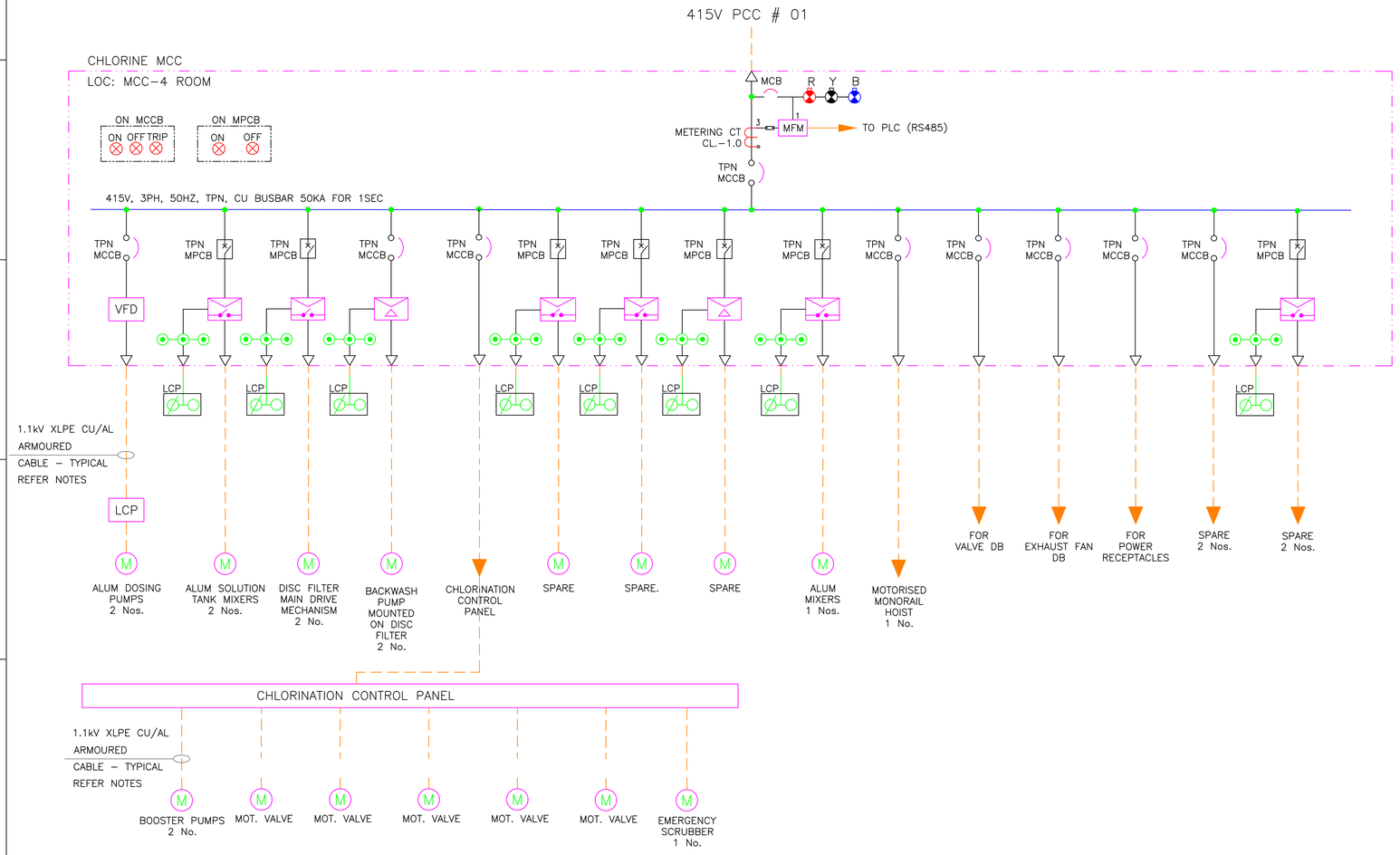
TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 50MLD STP, KADUBESENAHALLI

DWG NO: TCE.13052A-EL-4000-AU-40015

NOTES:-

1. FOR GENERAL NOTES, LEGENDS, REFER DRAWING NO. TCE.13052A-EL-4001-AU-40011.


415V PCC # 01
MAIN LIGHTING DB (MLDB)
LOC: SUBSTATION ROOM
ON MCCB
ON OFF TRIP
MCB
R Y B
METERING CT CL.-1.0
MFM
TO PLC (RS485)
TPN MCCB+RCCB
415V, 3PH, 50HZ, TPN, CU BUSBAR 25KA FOR 1SEC
TPN MCCB
1.1kV XLPE CU/AL ARMOURED CABLE - TYPICAL REFER NOTES
LIGHTING DB FOR TSPS PUMP HOUSE
LIGHTING DB FOR PROCESS AIR BLOWER BUILDING
LIGHTING DB FOR CENTRIFUGE BUILDING
LIGHTING DB FOR CHLORINE BUILDING
LIGHTING DB FOR RAS BUILDING
LIGHTING DB FOR SUB-STATION BUILDING
STREET LIGHTING DB-1
STREET LIGHTING DB-2
LIGHTING DB FOR DG ROOM
SPARE 3 Nos.



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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 50 MLD CAPACITY STP AT KADABEESANAHALLI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 05 OF 06

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DC & DISC : BLR-EL		

SIZE-A1

FILE NAME: F-091-Rev-R1.dwg

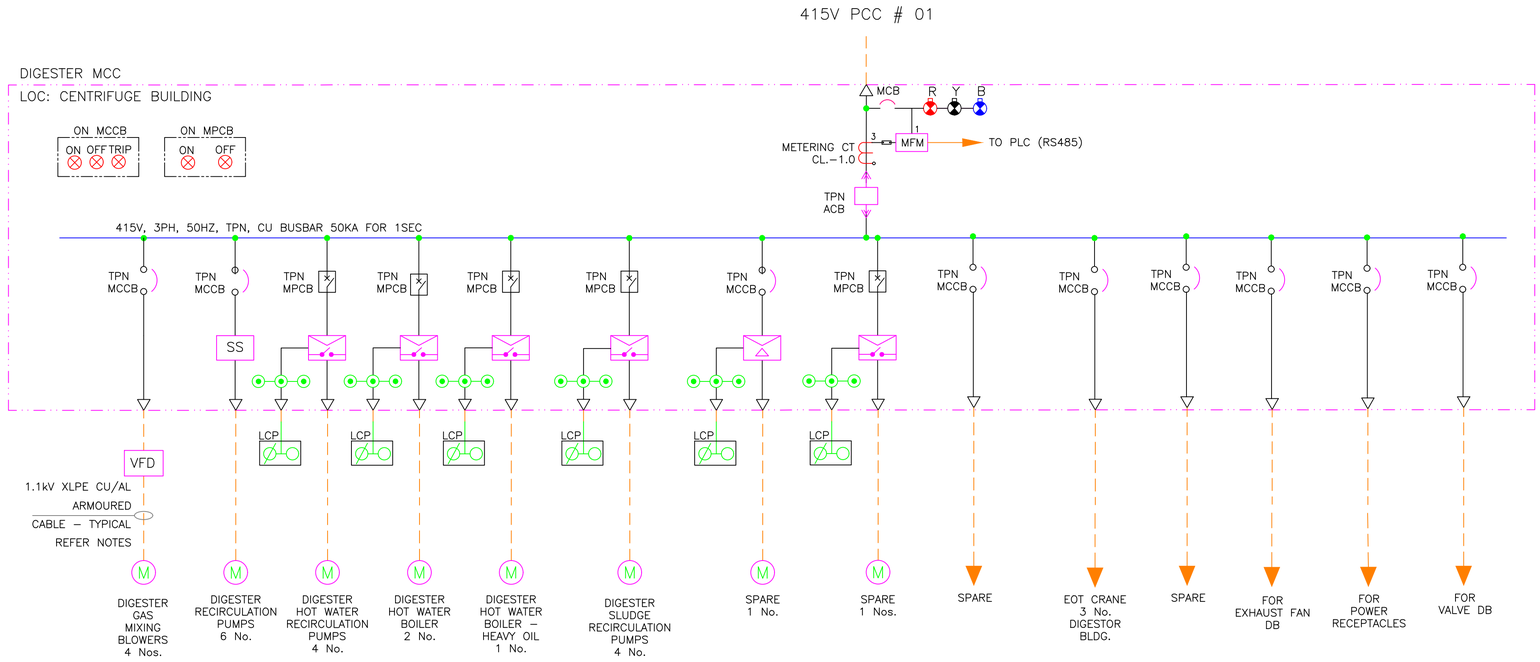
TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 50MLD STP, KADUBEESENAHALLI

DWG NO: TCE.13052A-EL-4000-AU-40015

NOTES:-

1. FOR GENERAL NOTES, LEGENDS, REFER DRAWING NO. TCE.13052A-EL-4001-AU-40011.



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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 50 MLD CAPACITY STP AT KADABEESANAHALLI

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 06 OF 06

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